US Army Corps of Engineers®
Engineer Research and Development Center

Geographic Information Integration and Generation Tools

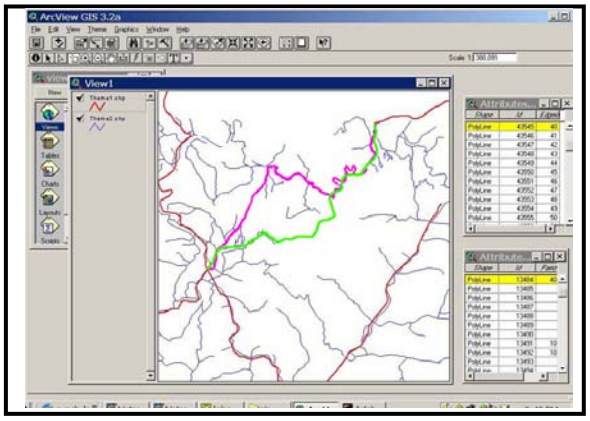
Description and Background

The compilation of spatial map information is a manual, expensive, error-prone process that historically has been the responsibility of large Government agencies using carefully-controlled single sensor imagery. The last fifteen years have brought dramatic changes to mapping technology. Today, high quality spatial information may be produced by state, local, commercial organizations and even private citizens. Input data sources range from the conventional to hyper-spectral to unmanned air vehicles to cellular phones. The exploitation of spatial map information from multiple sources results in a disturbing reality: multi-source data over the same geographical area are disparate, both spatially and thematically. The disparity can be due to scale, resolution, compilation standards, operator license, source accuracy, registration, sensor characteristics, currency, temporality, or errors. A research effort entitled Geographic Information Integration and Generation Tools (GIIGT) is addressing theses technical problems. Automated techniques to register multi-sensor imagery are under development. Methods for integrating Digital Elevation Models from passive and active sensors are being tested, as are methods for handling disparate vector feature and attribution data. Methods for managing, exploiting, mining, and verifying multi-source data are further challenges being worked.

Key Capabilities

Tools are being developed which will automatically integrate, manage and exploit multi-source imagery, elevation data, and spatial features.

Current Status



GIIGT is an U.S. Army Scientific and Technical Objective Research Initiative for FY2003-2006. Methods for registering multi-sensor imagery using automatic image edge correlation have been developed and are being evaluated for transition. Algorithms to merge elevation data from imagery, laser, and radar methods are being developed and tested. An automatic system which matches multiple vector features across differing map sources and performs "feature linking" can produce a "best map" is being sponsored. Other efforts involve the developments of an object-oriented spatial management model and spatial data mining software.

Point of Contact

Dan Edwards, dedward@tec.army.mil, (703) 428-7835